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Abstract

Greater Yellowstone provides a compelling test case for the emerging concept of ecosystem management on public lands. Containing charismatic natural resources as well as diverse local communities, the Greater Yellowstone region—now commonly referred to as the Greater Yellowstone Ecosystem—suffers from ecological fragmentation and accelerating development pressures. In 1987 the U.S. Department of Agriculture Forest Service and the U.S. Department of the Interior National Park Service, acting through the Greater Yellowstone Coordinating Committee (GYCC), jointly undertook a widely heralded interagency coordination process, which offered an opportunity to define and institutionalize ecosystem management principles on a regional scale. Confronted with conflicting national and local interests, the GYCC ultimately failed to adopt meaningful ecosystem management goals, leaving the region's immediate future shrouded in uncertainty. Nonetheless, the Greater Yellowstone experience has helped to refine the concept of ecosystem management and has provided important lessons about the pitfalls of interagency coordination. Moreover, the entire process has legitimized Greater Yellowstone as an ecological entity and has set the stage for further ecosystem-wide initiatives.

"Capt. Clark and Drewyer killed the largest brown bear this evening which we have yet seen. . . . Capt. Clark thought he would weigh 500 lbs. [F]or my own part I think the estimate too small by 100 lbs. [H]e measured 8 Feet 7½ Inches from the nose to the extremety of the hind feet. . . . [I]t was a monstrous beast. . . . [W]e now found that Bratton had shot him through the center of the lungs, notwithstanding which he had pursued him near half a mile. . . . [T]hese bear being so hard to die reather intimedates us all; I must confess that I do not like the gentlemen and had reather fight two Indians than one bear" (Moulton 1987).[1]

"The Yellow-stone has a large fresh water Lake near its head on the verry top of the Mountain which is about one hundred by forty Miles in diameter and as clear as crystal. [O]n the south borders of this lake is a number of hot and boiling springs, some of water and others of most beautiful fine clay and resembles that of a mush pot and throws its particles to the immense height of from twenty to thirty feet. . . . There is also a number of places where the pure suphor [sulfur] is sent forth in abundance. [O]ne of our men Visited one of those wilst taking his recreation. [T]here at an instan the earth began a tremendious trembling and he with dificulty made his escape when an explosion took place resembling that of thunder" (Haines 1977).

INTRODUCTION

Reports like these—the first being an entry from the Lewis and Clark expedition journals and the second being the first-known written account of Yellowstone's geothermal features—initially captured the nation's imagination and established the Yellowstone region as a special—even charismatic—place (Runte 1987, Haines 1977). In 1872, faced with mounting public sentiment to protect these unique natural assets, Congress showed unusual foresight by designating Yellowstone as the nation's first national park, thus permanently enshrining it as a

[1]The punctuation in the two extracts has been altered from the originals for the sake of clarity. *Ed.*

place of transcendent symbolic importance in conservation circles (Wright 1992, Chase 1986). Since then, a series of events significant in conservation history has affirmed the Yellowstone region's prominent role in the development of natural resources policy: the establishment in 1891 of the Yellowstone Timberland Reserve as the nation's first national forest just east of the park in what is now the Shoshone National Forest (Frome 1984), the lengthy struggle to create Grand Teton National Park in the spectacular Jackson Hole country (Righter 1982), and the adoption of a natural-process management philosophy in Yellowstone National Park (Leopold et al. 1963). Not surprisingly, each of these events generated intense opposition, often from local residents who perceived the proposed change as a direct threat to their livelihood or lifestyle.

Today controversy continues unabated in the Yellowstone region. Controversy has surfaced over the so-called vision document, fire policy, wolf reintroduction, bison management, geothermal protection, oil and gas leasing, timber harvesting practices, hard-rock mining proposals, and appropriate levels of development of recreation and tourism, to name just a few of the myriad matters recently in the news (Clark and Minta 1993, Goldstein 1992, Keiter and Boyce 1991).[2] The public attention directed toward these high-profile issues ensures that the charismatic Yellowstone country—now commonly known as the Greater Yellowstone Ecosystem—will continue to serve as a principal testing ground for natural resources policy (Wilkinson 1992b). With the region now being seen as an interconnected ecological entity, the focus is on ecosystem management, which is itself a controversial proposition (Grumbine 1992, Keiter and Boyce 1991). Greater Yellowstone provides a quintessential setting for testing the concept of ecosystem management, and it already has provided some important early lessons.

Western natural resources policy is formulated in three principal institutional settings: the legislative, executive, and judicial arenas. In fact, natural resources policy is developed, implemented, and interpreted through a complex, and often complementary, interplay among these institutions, which can be engaged at the federal, tribal, state, and local levels. Increased opportunity for public participation is an important development in contemporary natural resources policy: it allows interested citizens and organizations to inject public values into the decision-making process, and it enables them to probe underlying scientific and economic assumptions (Keiter 1990). Within this institutional setting, because virtually any change in the status quo is contentious, "losers" regularly seek to escalate the conflict to another level. Most policy decisions, therefore, will be made, or at least confirmed, in a political realm, where the final resolution usually turns on a question of values. In the Greater Yellowstone ecosystem management debate, with charismatic, nationally significant resources at issue, this almost certainly means that Congress will be the final arbiter, though this fact cannot—and should not—undermine efforts to achieve local consensus.

[2]Every one of these controversies has generated at least one—and often several—lawsuits. At last count, bison management was leading with seven different lawsuits in the past eight years (Keiter and Froelicher 1993).

GREATER YELLOWSTONE: JURISDICTIONAL AND ECOLOGICAL FRAGMENTATION

The Greater Yellowstone Ecosystem—or the Greater Yellowstone Area as the federal land management agencies prefer to call it—consists of two national parks, seven national forests, three national wildlife refuges, and other interspersed federal, state, and private lands, located in three different states—Idaho, Montana, and Wyoming (Figure 1). Yellowstone and Grand Teton National Parks, at the core of the ecosystem, are managed by the National Park Service under a preservationist mandate (16 U.S.C.S. §§ 1, 22, 406d-1 [1991]). The National Elk Refuge, Red Rock Lakes National Wildlife Refuge, and Greys Lake National Wildlife Refuge, which provide critical habitat for several prominent species, are managed by the U.S. Fish and Wildlife Service under a permanent conservation standard (16 U.S.C.S. § 668dd [1991]). Approximately 50 percent of the surrounding national forests are designated as wilderness and are also managed for preservationist purposes (16 U.S.C.S. §§ 1131, 1133 [1991]). For the most part, natural processes prevail on these lands; human intervention is frowned upon and minimized (Goldstein 1992, Keiter 1989).

A quite different philosophy prevails on the other Greater Yellowstone lands, where management authority is even more dispersed. The U.S. Department of Agriculture (USDA) Forest Service manages the remaining national forestlands under a multiple-use mandate, which allows such activities as mining, timber harvesting, grazing, and motorized recreation (16 U.S.C.S. § 528 [1991]). These forestlands are managed intensively to provide goods and services for human consumption. Outside the national parks, wildlife-management authority on federal lands is shared with the states, though the Endangered Species Act displaces state authority in the case of the six listed species found locally (16 U.S.C.S. § 1535[f] [1984]; see generally Coggins & Ward, The

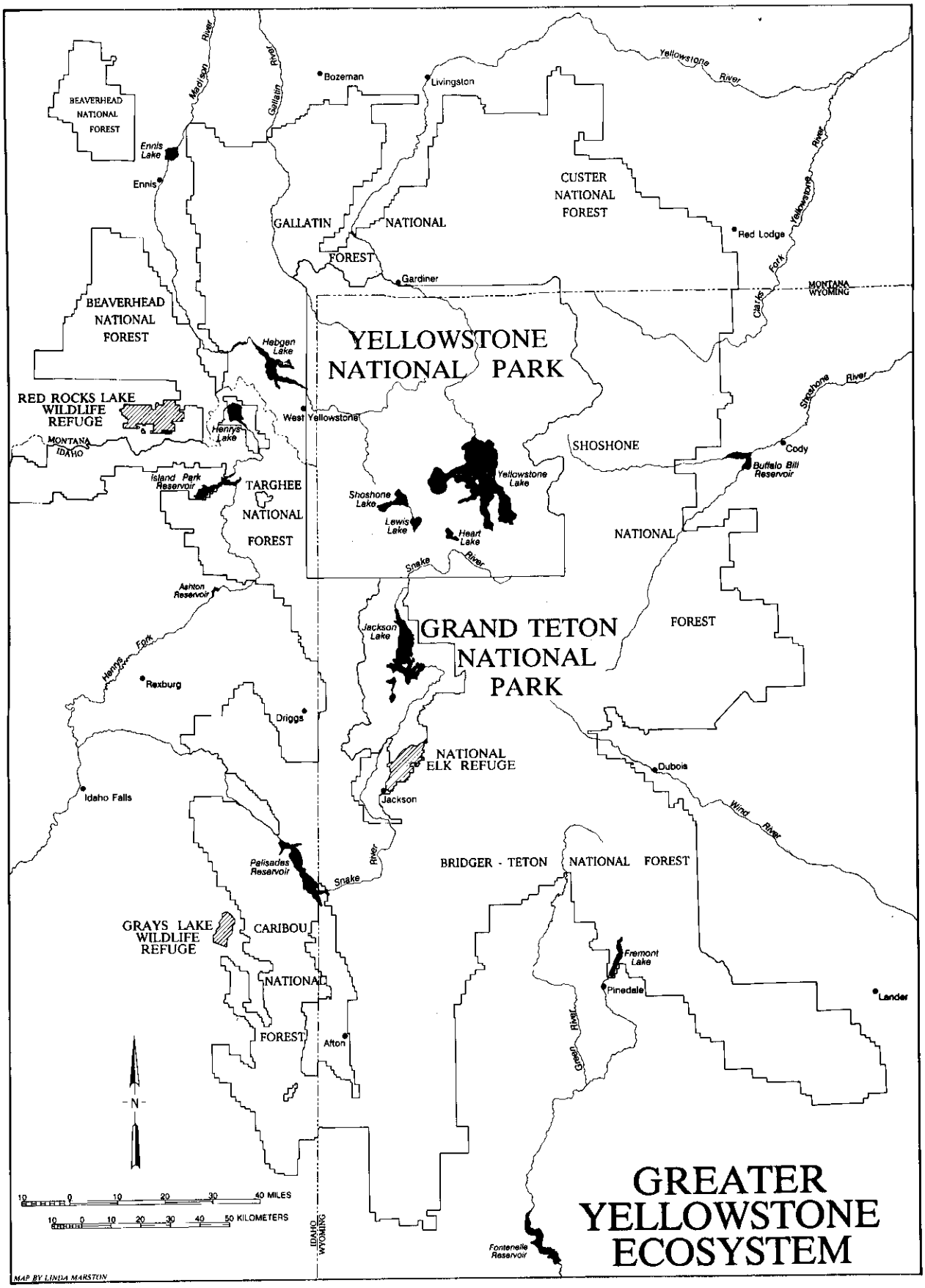

Figure 1. Map courtesy of the Greater Yellowstone Coalition.

ers agree that several common ecological features—including grizzly-bear habitat, ungulate range, geothermal aquifers, vegetation patterns, and watersheds—provide a framework for defining a Greater Yellowstone Ecosystem (Clark and Minta 1993, Glick et al. 1991). Of course, any suggestion of exactly where ecosystem boundaries should be drawn immediately stirs concern. Scientists and environmentalists assert that ecosystem processes are dynamic and cannot be confined by static boundaries (Patten 1991), while commodity interests and many local residents see ecosystem-based boundaries as an expansion of federal authority and constraining regulations (Budd 1991).

Many observers also believe that the ecosystem suffers from fragmentation, often the result of intensive development pressure and related road construction, as well as escalating private-land development (Glick et al. 1991, Congressional Research Service 1986). While individual timber sales, oil-exploration ventures, or ski-resort proposals do not portend ecological disaster, the cumulative effect of serial development projects, along with continued incursions into areas that currently have no roads and the unrelenting subdivision of private lands, is dramatically altering the landscape to the detriment of wildlife and natural processes (Glick et al. 1991, Keiter 1989). In other words, the growing presence of people poses a very real threat to the regional ecology.

Many residents, however, view any commitment to a management philosophy giving ecosystem processes priority over human interests as a threat to local communities and economic needs. The National Park Service's policy of permitting brucellosis-exposed bison to roam freely is seen as a threat to local ranchers and to state cattle industries (Keiter and Froelicher 1993, Thorne et al. 1991); a fire policy that permits natural fires to burn is seen as a threat to local property owners and to businesses, who recall that the 1988 fires destroyed private cabins and severely truncated the summer tourist season (Varley and Schullery 1991); and wolf restoration is seen as a threat by local ranchers who are concerned about predation and by the extractive industries who fear the restraints that might be imposed under the Endangered Species Act (Mech 1991, Keiter and Holscher 1990). These same individuals, however, have long understood that the national parks and their resources are linked inextricably to the economic welfare of the gateway communities, as illustrated by Cody, Wyoming's, long struggle to prevent Yellowstone officials from closing the Fishing Bridge campground (Keiter 1989, Chase 1986). The challenge, therefore, is to devise functional policies that protect the region's ecological integrity while also ensuring stable communities and economic opportunity.

ECOSYSTEM MANAGEMENT: LESSONS FROM GREATER YELLOWSTONE

Across the public domain, federal land managers—fully cognizant of the impact ecological fragmentation is having on biophysical resources and equally well aware of the fragmented political/jurisdictional environment in which they operate—have endorsed the concept of ecosystem management as a guiding resource management principle (Salwasser et al. 1987, Newmark 1985). The National Park Service, the U. S. Fish and Wildlife Service, the Forest Service, and the Bureau of Land Management have each now openly embraced the concept. State resource management agencies, as reflected in California's interagency biodiversity conservation initiative, have also endorsed the concept (Grumbine 1992). Nonetheless, confusion and uncertainty persist over how ecosystem management should be defined and what it means in practice. The Forest Service evidently views it largely as a process for integrating contemporary forestry research with public values to set management priorities. Others view it more as a concrete set of substantive limitations on managerial prerogatives designed to minimize disruption of natural ecological processes.

Although ecosystem management has not yet been fully defined, the concept itself rests upon several widely shared propositions. These include the following: (1) ecosystems are dynamic, inherently unstable, and cannot be easily defined in conventional jurisdictional terms; (2) all ecological components or species merit consideration to protect interrelationships, linkages, and evolutionary processes; (3) human communities must be considered part of the ecosystem with management policies geared toward sustainable development compatible with ecosystem health; (4) sophisticated scientific knowledge and monitoring are necessary to develop management objectives, measure progress, and make adaptations; and (5) management proposals must be devised and evaluated using an ecologically appropriate time scale (Commission on Research and Research Management 1989, Agee and Johnson 1988). In short, ecosystem management requires that natural resources policies be framed at the appropriate spatial and temporal scale to meet human needs without undermining the ecological integrity of underlying resource systems and processes.

In Greater Yellowstone, several important dimensions of an emerging ecosystem management policy can now be identified. First, ecosystem management is built upon cooperative interagency institutional structures, as well as public involvement and support. Second, ecosystem management draws heavily

upon scientific principles and research; it requires an improved understanding of ecological systems so that management proposals can be designed to minimize disruption of natural processes. Third, ecosystem management is committed to preserving and restoring biological diversity within regional fauna and flora. Fourth, ecosystem management policies must manifest broadly shared public values, which means that aesthetic concerns and amenity values ordinarily should be given priority in areas where public lands have been set aside for parks and wilderness. Finally, ecosystem management should promote sustainable resource-development activities compatible with underlying ecological processes to ensure viable local communities and economic opportunities (Keiter 1994, Clark and Minta 1993, Keiter and Boyce 1991).

Thus far, the principal approach to ecosystem management in Greater Yellowstone has been to promote interagency coordination. In the mid 1980s, spurred by the threat of congressional intervention, the National Park Service and the Forest Service undertook a high-profile coordination process to improve regional resource management decisions. Acting through the Greater Yellowstone Coordinating Committee (GYCC), an umbrella group composed exclusively of federal land managers, the two agencies aggregated individual park- and forest-management plans into a profile of the region to identify shared resources as well as managerial disparities (Greater Yellowstone Coordinating Committee 1987). The GYCC then undertook to prepare a *vision document* to establish a future framework for managing the region. The proposed vision document was intended to produce a set of guiding principles for coordinated management that would then provide the basis for amending regional guides, forest plans, and general management plans. This *vision process* was expected to establish Greater Yellowstone as a "world class model" for integrated, coordinated natural resources management (Clark and Minta 1993, Goldstein 1992, Keiter and Boyce 1991).

The seventy-two-page draft vision document, when released for public comment, represented a remarkably far-reaching statement of federal conservation policy. In fact, the draft vision document offered considerable evidence that the National Park Service and the Forest Service—through this unprecedented coordination effort—were committed to managing Greater Yellowstone as an ecological entity. Openly acknowledging that the proposed coordinating criteria "represent new ways of doing business," the vision document provided expressly for ecosystem management and envisioned "a landscape where natural processes are operating with little hindrance on a grand scale . . . a combination of ecological processes operating with little restraint and humans moderating their activities so that they become a reasonable part of, rather than encumbrance upon, those processes" (Greater Yellowstone Coordinating Committee 1990). Upon seeing this overt endorsement of ecosystem management as well as language that might be interpreted to restrain extractive activities on multiple-use forestlands, and upon concluding that the vision document process could be adopted elsewhere on the public domain, the consumptive-use industries and related interest groups mobilized to undermine the process (Barbee et al. 1991). They showed up in force at scheduled public hearings to denounce the document and process, and they enlisted local congressional delegations to dilute the document without openly subverting the process (Goldstein 1992, U. S. House of Representatives Staff Report 1992).

Not surprisingly, the final document represented a pale version of the original draft, and the entire process has left Greater Yellowstone's immediate future clouded. Reading more like a bureaucratic memo than a visionary statement of natural resources policy, the eleven-page framework document reinforces the separate missions of the two agencies and contemplates little noticeable change in existing management policies (Greater Yellowstone Coordinating Committee 1991).[3] While articulating the noteworthy goal of maintaining functional ecosystems, the framework document does little more than acknowledge a need to understand better ecological repercussions that cross administrative boundaries. Gone is any language about ecosystem management or about preserving a sense of naturalness. No new institutional structures or procedures are in place to facilitate interagency coordination. Moreover, there is little evidence that the agencies are relying upon the document. The current bison-brucellosis controversy has thus far been addressed with no reference to the framework-document principles, though federal and state agencies are actively working together to find an acceptable solution (Keiter and Froelicher 1993). Similarly, one searches the Shoshone National Forest's Final Oil and Gas Leasing Environmental Impact Statement in vain for any reference to the framework document, interagency coordination, or functioning ecosystems (USDA Forest Service 1992). And it remains to be seen whether the framework document will directly influence forest plan revisions or national park planning.

What happened and what are the lessons? First, because the vision process was initiated by congressional prodding and because the Yellowstone region boasts charismatic resources of national significance,

[3]The document, however, does provide for no net increase in the total mileage of open roads in the national forests and national parks (Greater Yellowstone Coordinating Committee 1991).

the GYCC made a tactical error by not pursuing the vision document as a national initiative.[4] By keeping participation at the local level, the GYCC either ignored or did not recognize the potential power of vested local interests, and it was then unable to counteract this local pressure by calling upon a national constituency. Second, the GYCC's limited composition, which consists only of representatives from the National Park Service and the Forest Service, left it vulnerable to the charge that it did not represent local interests, and it was, therefore, unable to forge a mutually shared vision for the region or to garner necessary local public support (Freemuth and Cawley 1993). The GYCC's limited composition also subjected it to criticism from other federal agencies, thus undermining the impression that the vision document presented a unified federal policy. While these two observations might appear contradictory, an effective and enduring ecosystem management policy in Greater Yellowstone's fragmented jurisdictional environment must reflect some level of consensus between national and local interests, though irreconcilable conflicts ultimately must be resolved with reference to the national interest.

Third, by consciously choosing to ignore the National Environmental Policy Act (NEPA) process in order to bring the vision process to fruition promptly, the GYCC left itself open to the criticism that it did not adequately involve the public in the process (Goldstein 1992). While full NEPA-style evaluation for such an undertaking might be clumsy, expensive, and time consuming, it would have undercut any charges of procedural unfairness and focused the ensuing debate on substantive land- and resource-policy objectives. Fourth, it has been suggested that the vision process failed for lack of a clear problem definition at the outset (Clark and Minta 1993). By defining the problem that the GYCC was addressing simply as a lack of coordination, each constituency was effectively encouraged to identify its own pet peeves as "the coordination problem," which may or may not have coincided with the committee's perception of actual regional problems. Lacking any consensus at the outset, the likelihood of forging a mutually shared vision for the future was virtually nonexistent.

Of course, the GYCC cannot shoulder all of the blame for the vision document imbroglio. Scientists and environmental organizations have been the principal proponents of ecosystem management in Greater Yellowstone and elsewhere. While scientists can provide vital information necessary to understand ecological processes and the relationships between these processes and human activities (Keiter and Boyce 1991), environmental and other organizations must be prepared to mobilize public support and to supply the political muscle necessary to bring such fundamental change to fruition. Federal agency officials are ill positioned to engage in such activities, though they can and should be actively involved in educating the public about ecological realities. In the case of the vision process, national environmental groups, for whatever reason, did not aggressively support the initiative, making it difficult both to elevate the issue to the national level and to secure needed congressional support (Goldstein 1992, Barbee et al. 1991). Support from environmental groups for the document could have provided a significant gain—though perhaps an ambiguous one—for the environmental community, but it seemed unwilling or unable to figure out how to respond effectively once the draft vision document adopted much of what it advocated. As a result, the final vision document was not an ecosystem management manifesto.

In sum, several important lessons can be gleaned from the Greater Yellowstone vision process. One lesson is that federal agencies cannot expect to implement ecosystem management programs alone; they must involve other affected federal, state, and local agencies and officials. In appropriate circumstances, this inclusion may mean a seat at the table rather than a consultative role. Another lesson is that resource managers must be prepared from the outset to engage fully the public in a clearly defined process. Moreover, in a charismatic ecosystem like Greater Yellowstone, both national and local interests must be included and accommodated to create a workable ecosystem management policy.

BEYOND THE VISION DOCUMENT

Two related and particularly troublesome political developments surfaced in the aftermath of the vision process. Recurrently, federal land managers have been criticized—justifiably in many cases—for their insularity and unwillingness to engage in matters beyond their borders (Sax and Keiter 1987). At the same time, these managers are regularly chastised by others for extending themselves outside jurisdictional boundaries to address critical environmental matters (Budd 1991). In the case of the Greater Yellowstone vision process, the National Park Service and the Forest Service showed real institutional courage in venturing beyond their boundaries and undertaking an unprecedented interagency coordination effort, even if the results ultimately proved disappointing. The National Park Service regional

[4]There is some evidence, however, that high-level Department of the Interior officials vetoed a GYCC proposal to schedule out-of-region hearings (U.S. House of Representatives Staff Report 1992).

director, however, paid a heavy personal price: she was involuntarily transferred to the East Coast, evidently for her role in the vision process, and has now initiated litigation against the government (U.S. House of Representatives Staff Report 1992). In addition, the Forest Service's northern region forester, who also participated in the vision process, was also involuntarily reassigned, though his apparent transgression was an inability or unwillingness to meet timber targets at the expense of environmental concerns (High Country News 1991). Taken together, these two personnel moves, which were initiated at the highest levels of the National Park Service and the Forest Service, conveyed a strongly negative and unfortunate message to local land managers inclined to pursue progressive resource management policies.

Moreover, after investigating these personnel moves, a recent congressional staff report concludes that the vision process was purposefully undermined by top-level political officials to protect local constituent group interests (U.S. House of Representatives Staff Report 1992). Given the Yellowstone region's charismatic qualities, this revelation should not come as a surprise. In Greater Yellowstone, natural resources policy—whether progressive or regressive in content—is being shaped both at the local and at the national levels. In a related development, federal courts in the Pacific Northwest have uncovered evidence of similar high-level political intermeddling in the spotted-owl controversy (Portland Audubon Society v. Endangered Species Committee, 984 F.2d 1534 [9th Cir. 1993]; Seattle Audubon Society v. Evans, 771 F. Supp. 1081 [W.D. Wash. 1991], aff'd. in part, 952 F.2d 297 [9th Cir. 1991]). Again, this revelation probably should not come as a surprise; it reconfirms the limitations of science in the policy arena, which is ultimately a political setting where values and science are melded together (Keiter and Boyce 1991). However, the unfortunate side effect of these revelations is to destroy the trust and openness necessary even to begin seeking consensus solutions to ecosystem-wide problems at any level.

With Yellowstone National Park and the surrounding environs now joined as one under the evocative image of the Greater Yellowstone Ecosystem, natural resources policy simply cannot be established for the region without taking both national and local interests fully into account. At the national level, Greater Yellowstone is widely treasured for its natural attributes, including its geothermal features, abundant wildlife, open spaces, and recreational opportunities, not for its commodity resources or economic-development potential. Congress seems close to passing the Old Faithful Protection Act, a law that would protect Yellowstone's geothermal features from proposed development on adjacent private lands (Keiter 1993). Moreover, Congress is considering far-reaching reforms to several resource management laws, including the Mining Law of 1872 and grazing and timber subsidies, that could affect priorities and incentives in Greater Yellowstone and elsewhere (Wilkinson 1992a). Ever since assuming his post, Secretary of the Interior Bruce Babbitt, who is no stranger to Western natural resources controversies, has been speaking in terms of ecosystems and sustainable natural resources policies (Land Letter 1993)—ideas that are now at the heart of ecosystem management in Greater Yellowstone and elsewhere. In addition, the Greater Yellowstone Coalition, a major regional environmental organization, has now called for congressional passage of a Greater Yellowstone Ecosystem Conservation Act to protect ecologically important public lands and to provide incentives for private conservation efforts (Harting and Glick 1994).

Nonetheless, a functional Greater Yellowstone ecosystem management policy also must take account of regional, state, and local concerns, which have often embraced an agenda at odds with the national one. Besides the obvious reason that our democratic system is built upon the notion that people are entitled to exert control over their own destinies, local involvement is critical to address the vexing problem of private-land development, which is now spinning out of control in many locations under the twin pressures of industrial tourism and second-home development (Glick et al. 1991). Even though each of the three surrounding states still depends heavily upon extractive industries and agriculture, and even though the Yellowstone region will continue to be a critical testing ground in the ongoing conflict between environmental and commodity groups throughout the West, there is some evidence of an evolving local consensus on the region's future. Mounting scientific evidence of accelerating habitat loss and fragmentation and recent economic data revealing the declining role of commodity production in the regional economy are inexorably driving even recalcitrant local interests to acknowledge the need for a strong commitment to protect the region's ecological integrity and to begin to explore what that may mean. Various local initiatives, including numerous county, town, and citizen comprehensive planning efforts throughout the region, provide additional proof of this evolving consensus (Glick et al. 1991).

CONCLUSION

Although the high-profile Greater Yellowstone vision process—the federal land management agen-

cies' first major foray into the uncertain realm of ecosystem management—may not have borne the fruit that proponents originally contemplated, expectations may have outpaced reality. In a charismatic ecosystem like Greater Yellowstone, bold regional initiatives can and should be expected to serve as a lightning rod for controversy, particularly when the underlying concepts of ecosystem management remain ill defined and easily misunderstood. Nonetheless, the interagency coordination process has legitimized the notion that Greater Yellowstone is an integrated ecological entity and that management policies must take account of ecosystem realities. Ecosystem management proponents, therefore, should now promote these two notions at every opportunity, perhaps on a smaller scale in Greater Yellowstone and elsewhere, to give clear definition and meaning to the concept of ecosystem management. Moreover, they must demonstrate how adherence to ecosystem management principles can achieve the twin goals of ecological and economic sustainability.

Firmly rooted in the compelling logic of science, the ecosystem management concept also has a powerful metaphorical ring that resonates in public forums. Indeed, because natural resources policy ultimately is shaped through an open public dialogue in a political arena, the ecosystem management concept may have its greatest impact at this level. It can enable people to understand the full dimensions and complexity of contemporary natural resources management dilemmas, and it can help generate support for management at the appropriate geographic level and time scale. It can also help people understand that change is endemic in both natural and human systems; and just as the ecosystem concept takes into account the dignity of all species, man must construct ecosystem management institutions, processes, and standards that dignify all individuals by integrating human concerns into the equation. A full complement of diverse ecosystems can then thrive alongside sustainable human communities.

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